The Use of Electronic Medical Records and Physicians' Attitudes toward a Health Information Exchange

January 2010: Final Report

William G. Johnson, PhD
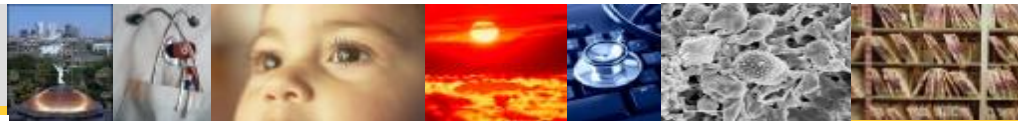
CHiR

AHCCCS

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Center for Health Information & Research

- Health Economics
- Data Mining
- Epidemiology
- Health Care IT/Data Managment
- Arizona HealthQuery (AZHQ) Community Health Data System

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Acknowledgements

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The data collection model and the results to be presented today would not have been possible without their dedicated cooperation.

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Highlights

- 45% of physicians use some form of EMR.

- Use of EMRs ranges from 71% in government organizations to 25% among solo practitioners.

- Only a little more than half of EMR users exchange any information with other health related organizations.
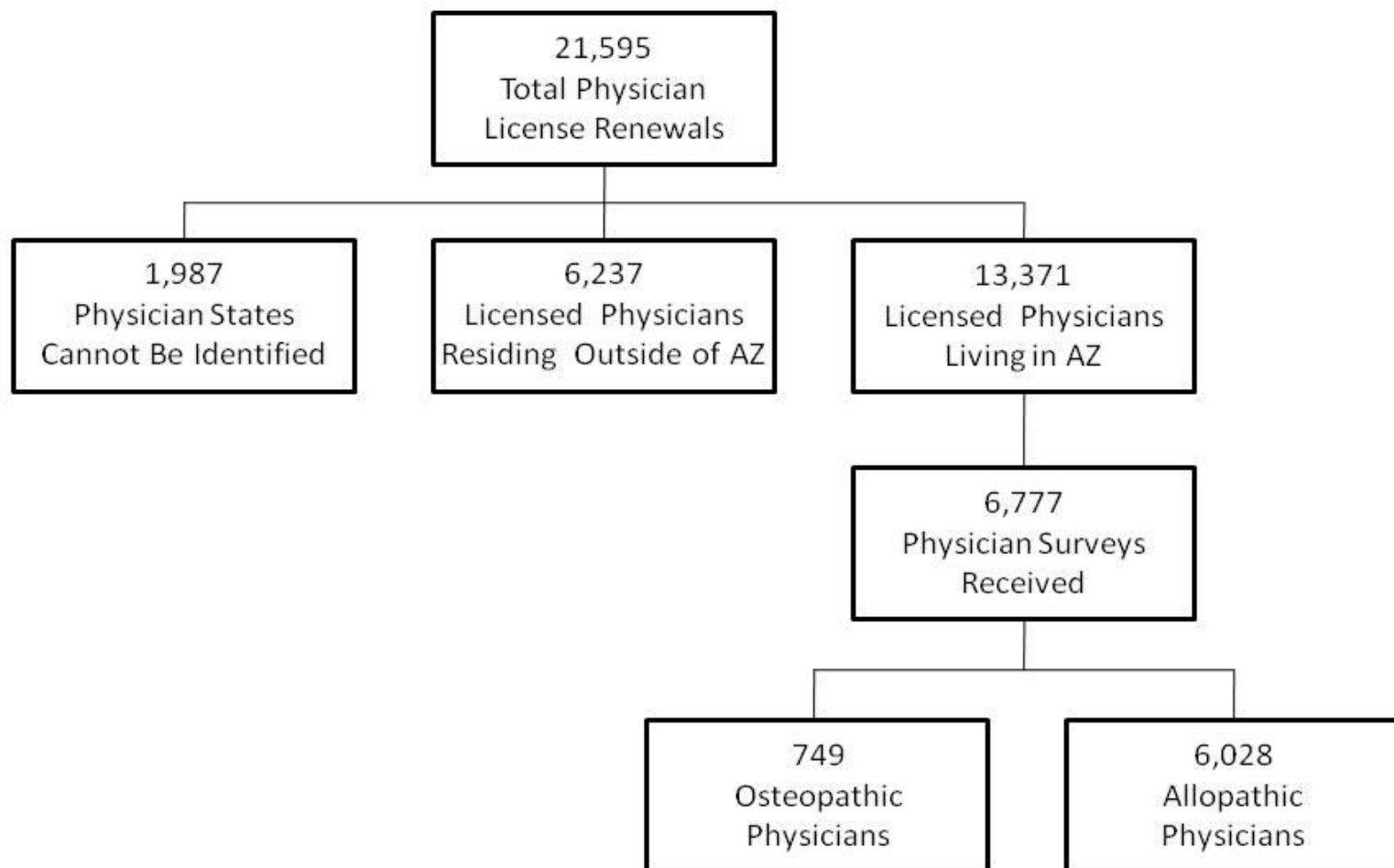
Data Collection Methods

- Licensing data (education, demographics, certifications)

  Merged with

- Survey data (questions differ across licensing cycles)

  - PPS: practicing physician survey

  - NPS: first time applicants for licenses

  - GRS: graduating residents survey (administered at completion of residencies)

  - RNs, APNs, LPNs: survey questions added to licensing applications

  - Pharmacists, pharmacy technicians: survey questions added to licensing applications

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Data Collection July 17, 2007 – July 17,2009

Methods of Storing Medical Records (N = 6,387)

Variable	Number Yes	% of total
Paper Files Only	2,911	45.6%
EMR Only	859	13.4%
Scanned Images Only	205	3.2%
EMR + Paper Only	484	7.6%
Paper + Scanned Images Only	393	6.2%
EMR + Scanned Images Only	742	11.6%
Paper + Scanned Images + EMR	793	12.4%
EMR alone or in combination*	2,878	45.1%

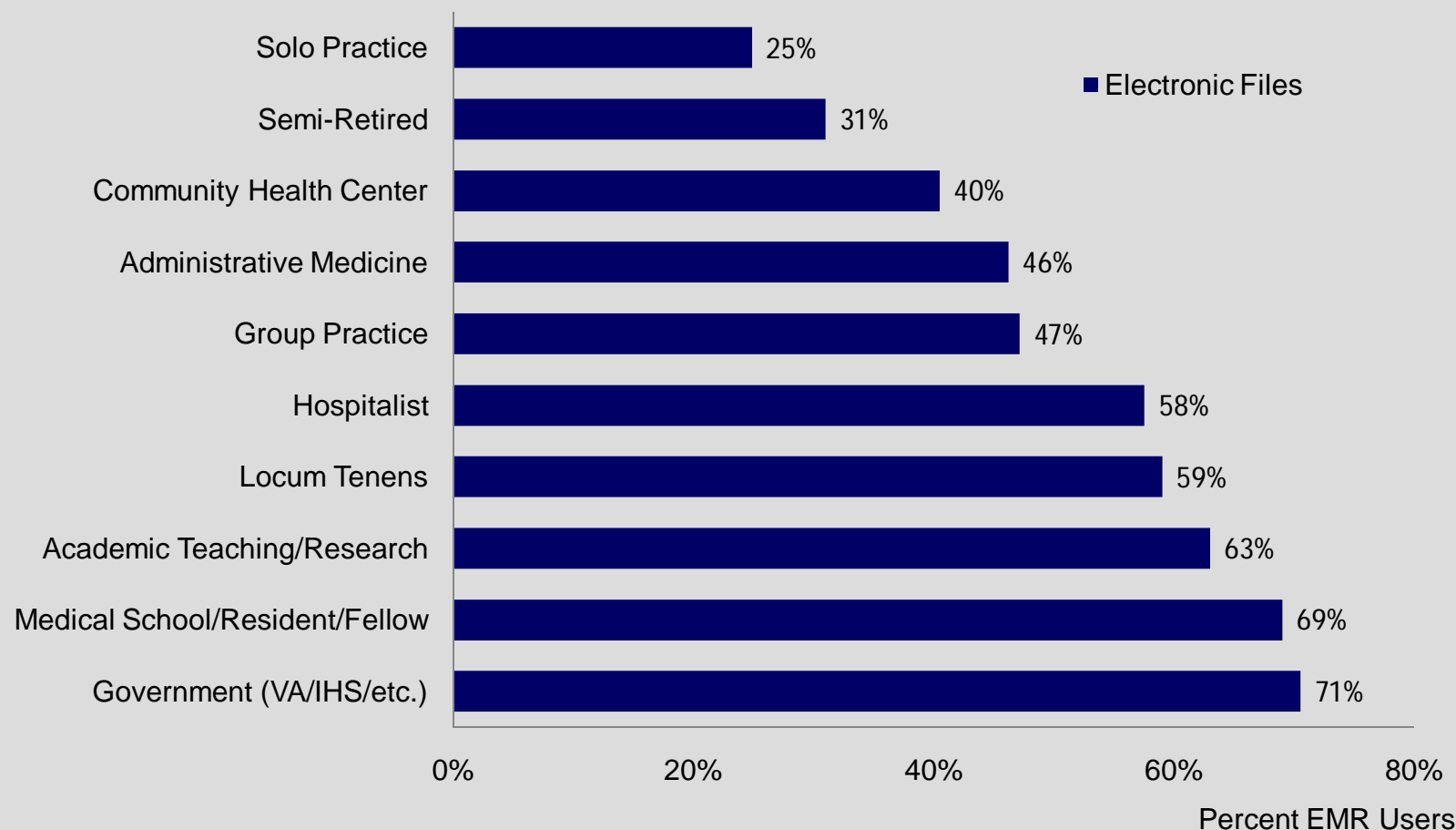**Paper files remain the dominant form of medical records**

Source: AMB, ABOE Survey Data, July 17, 2007 – July 17, 2009.
Note: 390 respondents did not identify a method of storing medical records (missing).
*Data on "EMR alone or in combination" is not mutually exclusive from other categories.

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Electronic Medical Record Usage by Type of Practice: Arizona Physicians

Chart: Percent EMR Users (Electronic Files)

Type of Practice	Percent
Solo Practice	25%
Semi-Retired	31%
Community Health Center	40%
Administrative Medicine	46%
Group Practice	47%
Hospitalist	58%
Locum Tenens	59%
Academic Teaching/Research	63%
Medical School/Resident/Fellow	69%
Government (VA/IHS/etc.)	71%

Source: AMB, ABOE Survey Data,
July 17, 2007 - July 17, 2009.
Note: 50 physicians with EMRs who did not specify a type of practice are not included in total for consistency.

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Multivariate Predictors of Being an EMR User/Connected EMR User

Variable	Odds Ratio (EMR User)	Odds Ratio (Connected EMR User)
Type of Practice (vs. Government)		
Group Practice	0.28	0.13
Community Health Center	0.23	0.08
Hospitalist	0.54	0.46
Solo Practice	0.08	0.02
Academic Teaching/Research	0.76	0.72
D.O. (vs. M.D.)	1.60*	1.04
Age (vs. 65 and older)		
25 to 34	3.16*	2.12*
35 to 44	2.49*	1.69*
45 to 54	2.12*	1.90*
55 to 64	2.07*	1.92*
Gender (Female vs. Male)	0.92	0.94
Location (vs. all AZ counties except Maricopa and Pima)		
Maricopa County	1.12	1.28
Pima County	1.18	0.89
Primary Care (vs. Specialty Care)	1.20*	0.89

Source: AMB, ABOE Survey Data, July 17, 2007 - July 17, 2009.
Note: 1,284 observations were deleted due to missing values.
*Statistically significant at p less than or equal to 0.05.

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Physician Characteristics Associated with EMR Use

- **Age, all else equal,** is one of the most important determinants of EMR use
  - The odds that a physician will use an EMR consistently and significantly increases as one moves from age 65+ to each of the younger age categories.
  - One can speculate that differences in culture, facility with computerized applications, and training experiences follow a similar distribution among ages.

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Physician Characteristics Associated with EMR Use (cont.)

– Physicians in government settings are , all else equal, significantly more likely to utilize EMR than physicians in group practice, solo practice, and community health centers.

– Female physicians are less likely than males to utilize an EMR (although they are not less likely exchange information if they use an EMR).

– DOs with EMRS are more likely than MDs to have EMRs and more likelty to have a connected EMR.

– Little difference among Maricopa, Pima and more rural counties

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EMRs and HIEs

- Utilization of EMRs not synonymous with participation in health information exchange.

- Only slightly more than 9% of AZ physicians have an EMR and exchange information with other entities electronically

Methods of Transmitting Medical Records (N = 2,878)

Variable	N	% of Connected EMR Users	% of EMR Users	% of All Eligible Physicians
Electronic File	2,878	-	100.0%	45.1%
Connected EMR System	1,558	100.0%	54.1%	24.1%
EMR System Connected to Hospital*	1,283	82.3%	44.6%	19.8%
EMR System Connected to Pharmacy*	1,008	64.7%	35.0%	15.6%
EMR System Connected to Lab*	1,341	86.1%	46.6%	20.7%
EMR System Connected to Radiology*	1,027	65.9%	35.7%	15.9%
"Fully Functional" EMR*	601	38.6%	20.9%	9.3%

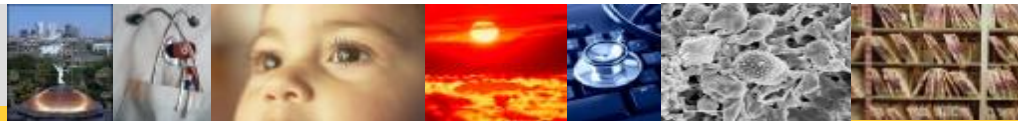Source: AMB, ABOE Survey Data, July 17, 2007 - July 17, 2009.
Note:
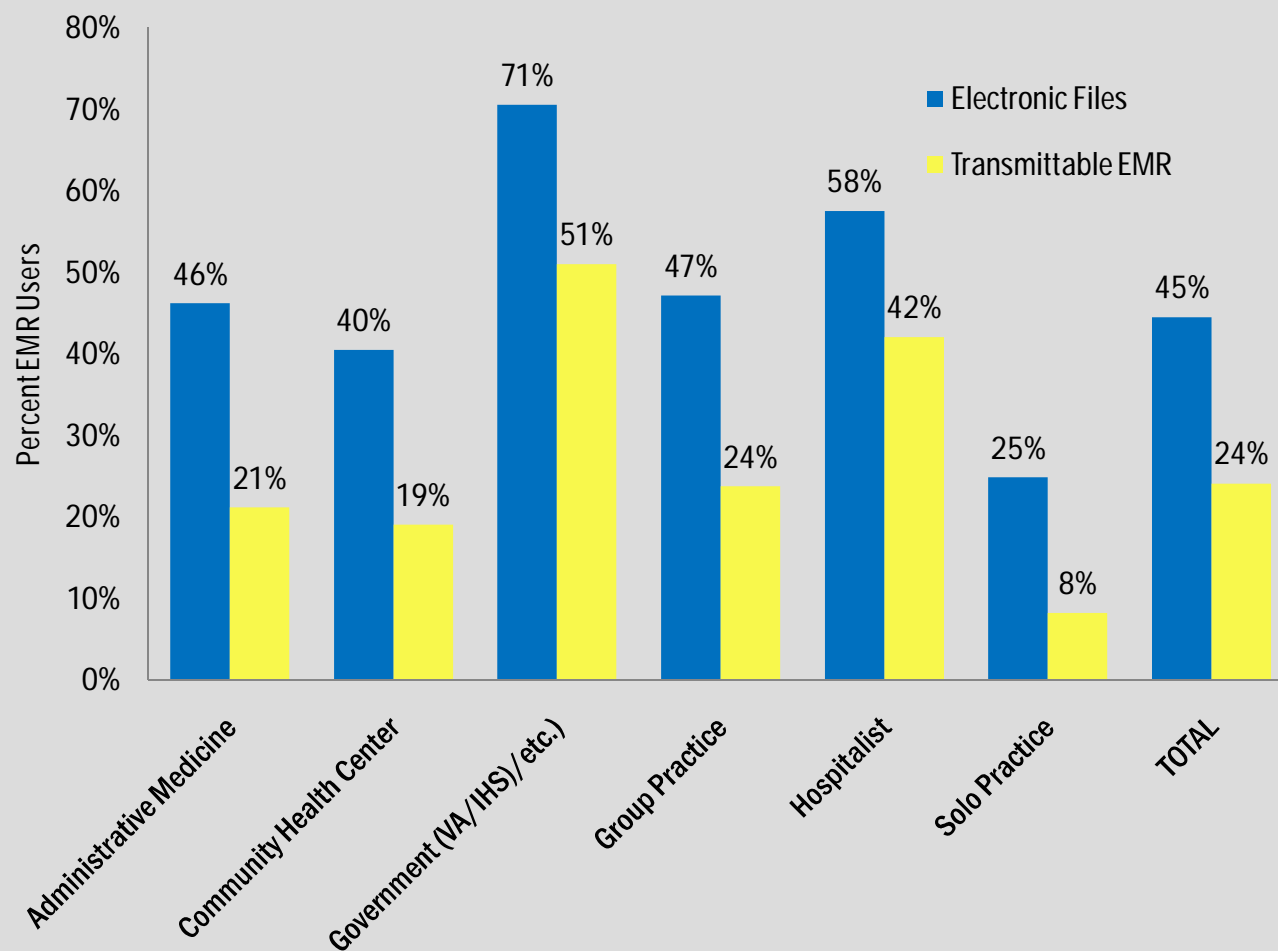*% based on all survey respondents. 310 respondents did not answer the question on files
**These percentages are not mutually exclusive.
A "fully functional" EMR is one that can exchange information with each of these segments of the health care system:
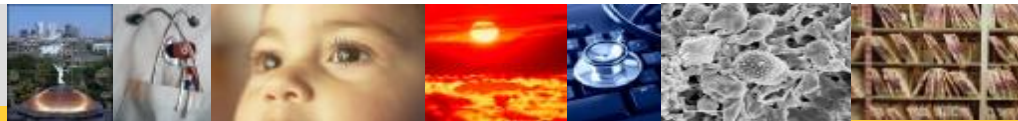pharmacy, lab and radiology.

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Users and of EMRs % Exchange of Information by Practice

EMR use is highest in government settings

Legend: Electronic Files, Transmittable EMR

Practice	Electronic Files	Transmittable EMR
Administrative Medicine	46%	21%
Community Health Center	40%	19%
Government (VA/IHS)/ etc.)	71%	51%
Group Practice	47%	24%
Hospitalist	58%	42%
Solo Practice	25%	8%
TOTAL	45%	24%

Y-axis: Percent EMR Users

Source: AMB, ABOE Survey Data, July 17, 2007 - July 17, 2009.
Note: 50 physicians with EMRs who did not specify a type of practice are not included in total for consistency.
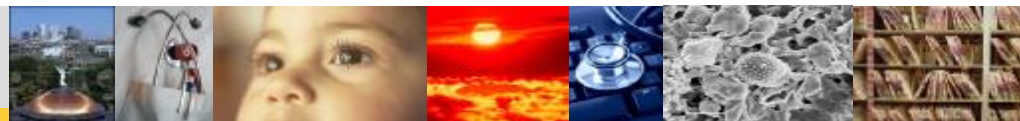
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Summary of Results

- Paper records remain the dominant form in which medical records are stored, whether as the sole medium of storage or in combination with EMRs or scanned files.

- Approximately 45% of physicians surveyed use some form of an EMR in their practice.

- EMR use is most prevalent in government practice settings and least prevalent in private solo practices.

- The probability of EMR use, controlling for all other influences, is significantly related to physician age. All else equal, the probability of use declines as physicians' ages increase.

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Summary (cont.)

- There is little difference in the prevalence of EMR use between the two most urban counties and other parts of Arizona.

- Physicians who use EMRs place a higher value on them than do physicians who have yet to adopt EMRs.

- Our estimates are much higher than those from a national survey published in the New England Journal of Medicine and much closer to a survey by the National Center for Health Statistics. Why such a large variance?

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Study	Data Source	Sample Size	Characteristics of Sample, Exclusions	Physicians with EMR*	Definition of basic EMR	Definition of connected EMR	Definition of fully functional EMR
Hing, et al. (2007)	2006 National Ambulatory Medical Care Survey	1,311	Non-federal, office-based physicians who see patients in an office setting	29.2% (B) 12.4% (F)	Use of full or partial electronic records	NA	Can electronically order prescriptions & tests, report results to lab or radiology; manage clinical notes
DesRoches, et al. (2008)	Survey created by the study team and Research Triangle Institute	2,758	Exclusions: D.O.s, residents, physicians in federally owned hospitals, retired physicians, radiologists, anesthesiologists, pathologists, psychiatrists, hospitalists, part-time, physicians who worked < 20 hour per week.	13% (C) 4% (F)	NA	EMR can store demographic data, problem lists, medication lists, and clinical notes; can order prescriptions; can view laboratory results and imaging results. (Study authors refer to this type of record as a "basic EMR")	All capabilities listed in previous column, plus enhanced order-entry management and clinical-decision support

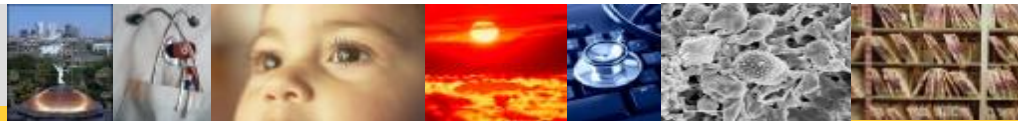# Comparison to the NEJM Study (N = 544)

Variable	N	% of Connected EMR Users	% of EMR Users	% of All Eligible Physicians
Electronic File	544	-	100.0%	37.6%
Connected EMR System	242	100.0%	44.5%	16.7%
"Fully Functional" EMR*	77	31.8%	14.2%	5.2%

Source: AMB, ABOE Survey Data, July 17, 2007 - May 30, 2008.

Note: *These percentages are not mutually exclusive. A "fully functional" EMR is one that can exchange information with each of these segments of the health care system: pharmacy, lab and radiology.

This sample includes Arizona-based physicians who provide direct patient care, and exclude the following: D.O.s, residents, retired/semi-retired, physicians in government settings, radiologists, anesthesiologists, pathologists, psychiatrists, hospitalists.

The Target Group

Survey respondents without EMRs   =3,882

Respondents weighted to represent
all physicians practicing in Arizona   =7,665

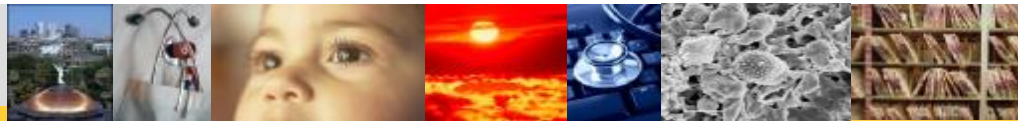Approximately 64% in Marcopa County

Approximately 20% in Pima County

Who is the Decision Maker?

Decision maker for potential purchase of EMR system	Number of EMR Users	% of EMR Users	Number of non-EMR Users	% of non-EMR Users
Respondent was/would be decision maker	284	12.2%	875	26.8%
Shared decision	454	19.6%	950	29.1%
Decided by others	1,584	68.2%	1,744	44.2%
Total	2,322	100%	3,269	100%

Source: AMB, ABOE Survey Data, July 17, 2007 – July 17,2009
Note: There were 556 missing responses among EMR users and 320missing responses among non-users.

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Who would you trust to manage an HIE?
(N=2,740)

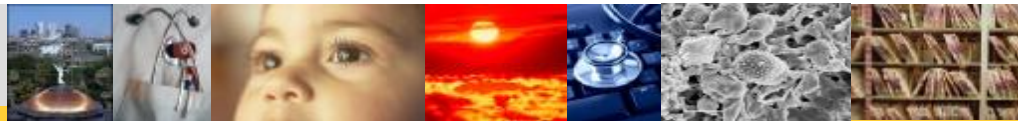| Rank	Type of Organization	Percent
1	Hospital system	42.3%
2	RHIO	36.9%
3	Commercial vendor	33.8%
4	State of Arizona (AHCCCS)	32.4%
5	Other	16.6%
6	Health insurer/managed care plan	12.3%

Source: AMB, ABOE Survey Data, July 17, 2007 July 17,2009
Note: 3,957 respondents did not answer this question. Percentages are for respondents only.

Conclusion

- Percentage of physicians with EMRs is higher than national studies suggest

- Creation of target group requires distinguishing between users and decision makers

- Use of EMRs is generally limited to intra-office use with little exchange capability

- Use of EMRs is much higher the larger the organization

- Use of EMRs is inversely related to age

- Variance among counties is very large with some rural counties having utilization rates nearly as high as Maricopa and Pima

- Acceptance of concept of an HIE with a state government home is limited

Discussion

- How might we use this information to inform AHCCCS strategies and initiatives to expand EMR use?

- What other sub analyses would be useful for AHCCCS? Plans? AzHeC? Legislators?

- Could any of the questions be revised or changed to better capture the changing landscape?

- There is no current sponsorship for continuation of the EMR survey although a proposal has been submitted by AzHeC.

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Final Thoughts

- A full copy of the report can be obtained from CHiR (william.g.johnson@asu.edu)

- The full report includes an Appendix that duplicates the results, excluding providers who do not serve AHCCCS patients

- Comments and suggestions for follow up questions are invited.

- Thank you!

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Center for Health Information & Research

Web Site: http://chir.asu.edu

Email: chir@asu.edu

Main   602.496.2021
Fax   602.496.2020

William G. Johnson, PhD

Director, CHIR
Professor of Biomedical Informatics
william.g.johnson@asu.edu
Phone   602.496.2010
Cell   602.516.4241

Mail Code 8120
502 E Monroe St, Ste C320
Phoenix, AZ 85004-2430

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